UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/015,848	12/10/2001	Adrian W. Payne	GB 010002	7605

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EXAMINER
PERILLA, JASON M

ART UNIT	PAPER NUMBER
2611	

DATE MAILED: 05/31/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
  Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1) ☒ Responsive to communication(s) filed on *17 March 2006*.

2a) ☐ This action is **FINAL.**   2b) ☒ This action is non-final.

3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4) ☒ Claim(s) *1,2,6-11,13,14 and 16-18* is/are pending in the application.

     4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5) ☒ Claim(s) *10 and 11* is/are allowed.

6) ☒ Claim(s) *1,2,6-8,13,14,16 and 17* is/are rejected.

7) ☒ Claim(s) *9 and 18* is/are objected to.

8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9) ☐ The specification is objected to by the Examiner.

10) ☒ The drawing(s) filed on *06 July 2005* is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.

     Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

     Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

     a) ☒ All   b) ☐ Some * c) ☐ None of:

       1. ☒ Certified copies of the priority documents have been received.

       2. ☐ Certified copies of the priority documents have been received in Application No. _____.

       3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

     * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)   4) ☐ Interview Summary (PTO-413)
                                                    Paper No(s)/Mail Date. _____ .
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)   5) ☐ Notice of Informal Patent Application (PTO-152)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)   6) ☐ Other: _____.
        Paper No(s)/Mail Date _____.

DETAILED ACTION

1.   Claims 1, 2, 6-11, 13, 14, and 16-18 are pending in the instant application.

Drawings

2.   The drawings are objected to because figure 4 lacks text labels for references

14, 52, 46, 42, and 44 and figure 7 lacks text labels for references 120, 122, 106, 108,

126, 130, 110, and 118. Corrected drawing sheets in compliance with 37 CFR 1.121(d)

are required in reply to the Office action to avoid abandonment of the application. Any

amended replacement drawing sheet should include all of the figures appearing on the

immediate prior version of the sheet, even if only one figure is being amended. The

figure or figure number of an amended drawing should not be labeled as "amended." If

a drawing figure is to be canceled, the appropriate figure must be removed from the

replacement sheet, and where necessary, the remaining figures must be renumbered

and appropriate changes made to the brief description of the several views of the

drawings for consistency. Additional replacement sheets may be necessary to show the

renumbering of the remaining figures. Each drawing sheet submitted after the filing date

of an application must be labeled in the top margin as either "Replacement Sheet" or

"New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the

examiner, the applicant will be notified and informed of any required corrective action in

the next Office action. The objection to the drawings will not be held in abeyance.

Response to Amendment

3.   The indication of allowable subject matter set forth in the office action dated

January 17, 2006 has been withdrawn in view of the newly found reference Eglit (U.S.

Pat. No. 6272193).

4.   New prior art rejections are set forth below.

Claim Objections

5.   Claims 1, 2, 6-11, 13, 14, and 16-18 are objected to because of informalities.

The following amendments are proposed by the Examiner to overcome the informalities:

Claim 1: A method, comprising:

determining ~~the~~ a value of a signal, in which N previously detected bits (where N

is at least 2) of a demodulated bit stream are used to select which one of a plurality of

threshold levels against which a current demodulated bit is to be compared in a bit slicer

and is to be updated using ~~a~~ the current demodulated bit;

oversampling the demodulated bit stream by a factor M, where M is an integer on

the order of 20; ~~, and~~

intermittently integrating at least one sample in the vicinity of the $M/2^{th}$ sample of

each of at least 2 bit periods to generate a demodulated signal to be compared with the

selected one of the threshold values;

comparing a result of the integrating with the selected threshold level; and

using the result to update the selected threshold value.

Claim 6: A method as claimed in Claim 1, further comprising: after oversampling the

demodulated bit stream, weighting samples of the demodulated bit stream.

Claim 7: A method as claimed in claim 1, further comprising: ~~selecting one of the~~

~~plurality of preset default threshold values in accordance with a bit sequence formed by~~

~~the N previously detected bits and a latest detected bit as determined by the bit slicer,~~

~~obtaining a demodulated signal integrated over at least 2 bit periods~~, subtracting the

demodulated signal from one of a plurality of selected preset default values to produce a

current dc offset estimate, deriving a mean dc offset estimate from the current dc offset estimate and a plurality of preceding dc offset estimates, combining the mean dc offset estimate with a the selected threshold value and applying the combined signal to a threshold input of the bit slicer.

Claim 13: A receiver having a variable threshold slicer, comprising means for deriving a demodulated bit signal stream, means for storing a plurality of threshold values, each of the plurality of threshold values being selectively adjustable, means for selecting one of the plurality of threshold values for comparison with a current bit and for adjustment in response to a sequence of N bits (where N is at least 2) received prior to the current bit and means for using the current bit to update the selected threshold value; and

means for oversampling the demodulated bit stream by a factor M, where M is an integer on the order of 20, and means for intermittently integrating at least one sample in the vicinity of the M/2 sample of each of at least 2 bit periods to generate a demodulated signal to be compared with the selected one of the plurality of threshold values.

Claim 14: A receiver as claimed in claim 13, wherein the means for deriving the demodulated bit signal stream includes a non-continuous integrate and dump stage for integrating the demodulated bit signal stream over a predetermined number of bit periods and supplying a result to the variable threshold bit slicer and to the means for updating the selected threshold value.

Claim 16: A receiver as claimed in Claim 13, further comprising: means for weighting the samples obtained by oversampling, and means for integrating the weighted samples to generate the demodulated signal to be compared with the selected one of the plurality of threshold values.

Claim 17: A receiver as claimed in claim 13, further comprising: means for obtaining a demodulated signal integrated over at least 2 bit periods, means for subtracting the demodulated signal from a selected preset default value to produce a current dc offset estimate, means for deriving a mean dc offset estimate from a current

dc offset estimate and a plurality of preceding dc offset estimates, and means for combining the mean dc offset estimate with the selected one of the plurality of threshold values and for applying the combined signal to a threshold input of the variable threshold bit slicer.

Appropriate correction is required.

Claim Rejections - 35 USC § 103

6.   The following is a quotation of 35 U.S.C. § 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1, 2, 7, 8, 13, 14, and 17 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Wang et al (US 5459762; hereafter "Wang" – previously cited) in view of Fumio Sugiyama (IDS paper April 22, 2002, reference AL; hereafter "Fumio" – previously cited, reference is made to translation submitted with first office action), and in further view of Eglit (U.S. Pat. No. 6272193).

Regarding claim 1, Wang discloses according to figure 6 a method of determining the value of a signal (I_1), in which N previously detected bits (where N is at least 2) of a demodulated bit stream (630 and 640; col. 2, lines 29-31) are used to select (650) which one of a plurality of threshold levels (fig. 7) against which the current demodulated bit is to be compared in a bit slicer (620); intermittently (fig. 7, ref. 615) integrating the demodulated bit stream over at least two bit periods (fig. 6, refs. 600 and

610) and comparing (fig. 6, ref. 620) the results with a selected threshold level (fig. 6,

ref. 650). Wang discloses using the output of the slicer (620) to update the threshold

level (650) which is applied to the slicer (negative input of slicer) for comparison against

the integrated demodulated bit stream (positive input of slicer). Wang does not explicitly

disclose that the result of the comparison output of the slicer is used to update the *value*

of the selected threshold level chosen. However, Fumio teaches an analogous slicer,

according to figure 5, wherein two bits held in the register (4) of a demodulated bit

stream (1) (pg. 7, lines 9-10) are used to select (5a, 7a; pg. 7, lines 13-15) one of a

plurality of threshold levels (6a-6d) against which the current demodulated bit is to be

compared in a bit slicer (2), and of which **value is to be updated** using the current

demodulated bit (8, 7b, fig. 5; pg. 7, lines 16-18). Fumio teaches that, accordingly to his

invention, "even in a case where a judgment threshold value deviated from an optimal

threshold value due to the variation of the AC level or DC level of an input signal, [the

updating is] to correct & assimilate the judgment threshold value toward *the optimal*

value on every data arrival occasion and *to render correct data judgments in a stable*

value after the assimilation" (pg. 6, "effects of the invention"). Therefore, it would have

been obvious to one having ordinary skill in the art at the time which the invention was

made to utilize the threshold value updating as taught by Fumio in the method of Wang

because it could advantageously be utilized to render correct and stable data judgments

after iteratively updating the threshold values. Therefore, the references 630, 640, and

650 (fig. 6) of Wang would be replaced by references 6, 5a, 5b, 8, 9, 7a, 7b, and 6a-6d

(fig. 5) of Fumio.

Further regarding claim 1, Wang discloses sampling (fig. 5, ref. 510/515) the

demodulated bit stream (fig. 5, "BASEBAND SIGNAL"), but Wang in view of Fumio do

not explicitly disclose oversampling the demodulated bit stream by a factor of M, where

M is an integer on the order of 20; and integrating at least one sample in the vicinity of

the M/2th sample for the at least 2 bit periods (as disclosed above) to generate the

demodulated signal to be compared. However, Eglit teaches a method of oversampling

(col. 1, lines 20-35) by a factor of L and using the plurality of samples to determine the

optimal sampling phase (col. 1, lines 30-40; col. 6, lines 10-25). Therefore, it would

have been obvious to one having ordinary skill in the art at the time which the invention

was made to utilize an oversampling technique as taught by Eglit in the method of

Wang in view of Fumio because, by overasampling, a specific and accurate sample

position and phase may be chosen that has the "maximum probability of representing

the current symbol" (col. 6, line 13).

Finally regarding claim 1, Wang in view of Fumio, and in further view of Eglit

disclose oversampling generically (i.e. by a factor of L), but not explicitly disclose

oversampling by a factor of M=20. However, it would have been obvious to one having

ordinary skill in the art at the time the invention was made to utilize an oversampling

rate of 20 because it has been held that discovering an optimum value of a result

effective variable (i.e. the rate of oversampling) involves only routine skill in the art. In

re Boesch and Slaney, 205 USPQ 215 (CCPA 1980).

Regarding claim 2, Wang in view of Fumio, and in further view of Eglit disclose

the limitations of claim 1 as applied above. Further, Fumio discloses having 2 mean

estimators (fig. 5, refs. 12a and 12b; pg. 8, lines 1-10) associated with each of the

threshold levels (fig. 5), and for a selected one of the threshold levels obtaining the

average or difference value (fig. 5, ref. 13) of the associated 2 mean estimators and

using the result as the current selected one of the threshold values (fig. 5, ref. 17).

Regarding claim 7, Wang in view of Fumio, and in further view of Eglit disclose

the limitations of claim 1 as applied above. Further, Fumio provides, according to figure

4, selecting (7b) one of the plurality of preset default threshold values in accordance

with a bit sequence (stored in 5b) formed by the N previously detected bits (stored in

register 6) and a latest detected bit (a(t)) as determined by the bit slicer (Wang; fig. 6,

ref. 620), obtaining a demodulated signal integrated over at least two bit periods (output

of switch 615 of Wang), subtracting (Fumio; fig. 5, ref. 8) the demodulated signal from

the one of the plurality of selected preset default values to produce a dc offset estimate

(output of subtracter), deriving a mean dc offset (Fumio; fig. 5, refs. 12d or 12b; pg. 8,

lines 1-10) from the current dc offset and a plurality of preceding dc offset estimates

(average 12a or 12b), combining the mean dc offset estimate with a selected threshold

value (Fumio; fig. 5, ref. 16) and applying via a switch (Fumio; fig. 5, ref. 7a) the

combined signal to a threshold input (Wang; fig. 6, ref. 620, negative input) of the bit

slicer.

Regarding claim 8, Wang in view of Fumio, and in further view of Eglit disclose

the limitations of claim 7 as applied above. Further, Fumio discloses subtracting the dc

offset (fig. 5, ref. 8) estimate from the demodulated signal prior to updating the selected

threshold value.

Regarding claim 13, Wang in view of Fumio, and in further view of Eglit disclose the limitations of claim 13 as applied to claim 1 above.

Regarding claim 14, Wang in view of Fumio, and in further view of Eglit disclose the limitations of claim 13. Further, Wang discloses the non-continuous integrate and dump stage as applied to claim 1 above.

Regarding claim 17, Wang in view of Fumio, and in further view of Eglit disclose the limitations of claim 13 as applied above. Further, Fumio discloses the remaining limitations of claim 17 as applied to claim 7 above.

7.   Claims 6 and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wang in view of Fumio, in further view of Eglit, and in further view of Kranz (US 6046643).

Regarding claim 6, Wang in view of Fumio, and in further view of Eglit disclose the limitations of claim 1 as applied above. Wang in view of Fumio disclose integrating the demodulated bit stream as applied to claim 1 above but do not explicitly disclose oversampling the demodulated bit stream and weighting the samples to generate a demodulated signal to be compared. However Kranz teaches a method of oversampling (fig. 1, ref. A) and weighting (fig. 1, ref. g2) a bit stream (col. 3, lines 28-30). One skilled in the art is aware that the oversampling and weighting of a bit stream provides a more accurate interpretation of an bit stream into a digital form. Therefore, it would have been obvious to one having ordinary skill in the art at the time which the invention was made to utilize oversampling and weighting as taught by Kranz in the method of Wang in view of Fumio, and in further view of Eglit.

Regarding claim 16, Wang in view of Fumio, and in further view of Eglit disclose

the limitations of claim 13 as applied above. Further, Wang in view of Fumio, in further

view of Eglit, and in further view of Kranz disclose the remaining limitations of claims 16

as applied to claim 6 above.

Allowable Subject Matter

8.   Claims 9 and 18 are objected to as being dependent upon a rejected base claim,

but would be allowable if rewritten in independent form including all of the limitations of

the base claim and any intervening claims.

9.   The indication of allowable subject matter is made regarding claims 10 and 11.

Conclusion

10.   Any inquiry concerning this communication or earlier communications from the

examiner should be directed to Jason M. Perilla whose telephone number is (571) 272-

3055. The examiner can normally be reached on M-F 8-5 EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's

supervisor, Chieh M. Fan can be reached on (571) 272-3042. The fax phone number

for the organization where this application or proceeding is assigned is 571-273-8300.

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USPTO Customer Service Representative or access to the automated information

system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Jason M. Perilla
May 25, 2006

jmp

CHIEH M. FAN
SUPERVISORY PATENT EXAMINER